SOCIETY OF ACTUARIES

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Pension Forecasts, Part I: Some Questions

by Lawrence N. Bader

Note: This article will be presented in two parts. The first part, appearing below, describes a simplified problem in pension plan financing and presents two questions about how that pension plan can be modeled. We hope that readers will ponder these questions and perhaps be moved to respond. The second part of the article, in the next issue of this newsletter, will discuss the answers to the questions raised below and their implications for traditional actuarial models.

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Consider this simplified pension plan and funding system. The liabilities consist of a single known benefit payment to be made 20 years from today. That benefit payment can be matched in timing and amount by a portfolio of 20-year zero-coupon Treasury bonds with a market value of $1 million. The plan assets also equal $1 million.

The company will make no interim contributions to or withdrawals from the plan. At the end of year 20, the company will wind up the plan by withdrawing the surplus or contributing to cover the deficit. (We ignore taxes and assume that there is no risk of default by the company.)

The corporate sponsor of this plan asks for your help. The assets are currently invested in the matching Treasury portfolio, which will ensure full funding of the plan with a company cost of zero. The sponsor believes that, over a 20-year horizon, equity investments would give rise to potential withdrawals that greatly outweigh the potential contributions in both probability and magnitude. So he asks you *Question #1: Ignoring taxes, how would shifting the $1 million from Treasuries into equities affect shareholder value?*

You decide to use a pension forecasting model. You prepare a series of 20-year simulations that show a range of terminal company contributions or withdrawals. To provide a single answer to Question #1,

you need to discount each of these terminal payments to a present value. This presents *Question #2: What discount rate should you use — the Treasury yield, the expected return on the plan assets, the company's borrowing rate, the company's weighted average cost of capital, or some other rate?*

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Termination and Retirement

The Society of Actuaries' (SOA) Non-Mortality Decrements Task Force is embarking on a new study of termination and retirement rates for employer-sponsored pension and post-retirement medical plans. The objective is to produce a series of termination and retirement rate tables reflecting the variety of plan characteristics appropriate for selecting valuation assumptions. After the initial tables are produced, the Task Force is planning on this project evolving into a regularly updated experience study.

The SOA has contacted an actuary at each of 53 pension consulting firms and insurers soliciting U.S. and Canadian data for this project. These firms are being asked to submit beginning and end of year census data for active participants for five or more plans for five recent years. All data will be kept confidential as to the plan source and the submitter.

The Task Force needs your support! If you did not receive a data request and can support this worthwhile project by submitting data, please contact Julie Rogers at (847) 706-3556 or *jrogers@soa.org* as soon as possible. Your contribution to this project is valuable and will help to create a valuable resource for all pension actuaries.